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Helen Odar Wolstoncroft

Name of Applicant, Assignee or
Registered Representative

Signature

Our Case No. 40534-930
Client Reference No. 1980037

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

In re Application of:

James W. Rudolph

Serial No.: 10/776,395

Filing Date: February 11, 2004

For: METHOD AND APPARATUS FOR
MEASUREMENT OF WEIGHT DURING
CVI/CVD PROCESS

Examiner: R. Gibson

Group Art Unit No. 2859

BRIEF ON APPEAL

Commissioner for Patents
PO Box 1450
Alexandria, VA 22313-1450

Dear Sir:

This is an appeal from the Final Rejection dated September 10, 2004.

This Brief on Appeal is being submitted in triplicate and enclosed is counsel's check in the amount of \$500 for filing this brief. The Commissioner is hereby authorized to charge payment of any additional filing fee required under 37 CFR § 1.16 and any patent application

processing fees under 37 CFR § 1.17 associated with this communication or credit any overpayment to Deposit Account No. 501581.

A personal appearance for presentation of oral argument is requested. The fee will be paid upon receipt of the Examiner's Answer.

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STATUS OF CLAIMS

Claims 15-18 stand finally rejected and are on appeal in this case.

REAL PARTY IN INTEREST

Goodrich Corporation is the real party in interest, as assignee of this application.

RELATED APPEALS AND INTERFERENCES

There are no related appeals or interferences.

STATUS OF AMENDMENTS

A Response to the Final Office Action was mailed on November 8, 2004. The Examiner considered the response but stated that it did not place the application in condition for allowance. Upon further questioning, the Examiner agreed to send a Supplementary Advisory Action in light of the fact that the addition of the limitation to claim 15 was not new matter. Nevertheless, the Examiner maintained his position that the request for reconsideration of the rejection did not place in the application in condition for allowance. Throughout the prosecution of this application, the Examiner has failed to consider the limitations set forth in the actual claims. Rather, the Examiner incorrectly maintained that the Board of Appeals and Interferences found the arguments made by Appellant with respect to his hodge-podge of references on OTHER CLAIMS unpersuasive. Rather than reviewing the actual limitations in the claims of this application, the Examiner maintained his rejection set forth in the parent case.

SUMMARY OF INVENTION

The present invention comprises a method and apparatus for measurement of weight during the CVI/CVD process. (Specification, title page and page 2, lines 20-22). The term CVI/CVD is intended to refer to infiltration and deposition of a matrix within a porous part or structure. (Specification, page 2, lines 20-22).

According to the present invention, a method is described to determine the weight change of parts in a furnace during a CVI/CVD process, which comprises weighing the entire furnace and its contents during the process. (Specification, page 3, lines 29-31).

The present invention describes a furnace and means for weighing the furnace. (Specification, page 3, line 32- page 4, line 4). The weighing means preferably comprises placing the furnace on load cells. (Specification, page 4, lines 4-5). Most preferably, the load cells are placed under the furnace so that the weight of the furnace is supported by the load cells. (Specification, page 4, lines 5-9).

An indicator unit is electrically connected to the means for weighing the furnace. (Specification, page 3, line 32-page 4, line 4). The indicator unit is monitored during the CVI/CVD process for the change in weight of the furnace as the change in weight of the parts in the furnace. (Specification, page 4, lines 2-4). The indicator unit may be tared immediately before the CVI/CVD process is commenced so as to reflect the change in weight of the parts directly. (Specification, page 4, lines 31-33).

The Appellant describes and claims the monitoring of the weight change of parts in a furnace during the CVI/CVD process. (Specification, page 3, line 32- page 4, line 4). The CVI/CVD process is terminated when the indicator unit indicates that the parts in the furnace have gained a prescribed amount of weight. (Specification, page 4, lines 16-25). The various process parameters which can be monitored include the furnace temperature, the reactant gas

flow rate, the internal furnace pressure, and the reactivity of the reactant gases. (Specification, page 6, lines 3-5).

In sum, the present invention comprises a method for weighing parts being subjected to a CVI/CVD process during the process itself to indicate a weight change thereof using a particular process parameter. (Specification, page 10, lines 1-7). The process may be terminated or altered as desired based upon the weight gain information obtained. (Specification, page 10, lines 1-7).

CONCISE STATEMENT OF THE ISSUES

Claims 15-18 were summarily rejected under 35 U.S.C. § 103(a) as being unpatentable over Golecki et al. (U.S. Patent No. 5,348,774) in view of Yoshida et al (U.S. Patent No. 4,964,734), Yano et al. (U.S. Patent No. 4,375,838), Spoor (U.S. Patent No. 4,217,785), Piroozmandi (U.S. Patent No. 5,770,823) and Swartzendruber (U.S. Patent No. 4,044,920). The issue is whether the claims describe an invention which is not obvious from these multiple unrelated prior art references.

GROUPING OF THE CLAIMS

For the purposes of this Appeal, the rejected claims do not stand or fall together. Each claim stands or falls alone. Each independent claim describes the monitoring of specific process parameter and the changing of the parameter in response to the process to achieve the desired weight gain of the part during a CVI/CVD process. For example, claim 15 monitors the furnace temperature; claim 16, the reactant gas flow; claim 17, the internal furnace pressure, and claim 18, the reactivity of the gas. Appellant submits that the monitoring of the weight gain of a part using each one of these independent process parameters makes each of the independent claims patentably distinct.

ARGUMENTS OF APPELLANT

35 U.S.C. § 103(a) Obviousness Rejection Over Golecki et al. in view of a multitude of unrelated references

Claims 15-18 have been finally rejected under 35 U.S.C. §103 (a) over Golecki et al. in view of Yoshida et al., Yano et al., Spoor, Piroozmandi, and Swartzendruber. The Examiner relies upon this improper combination to teach that Appellant's method of determining the change and weight in parts by monitoring a particular process parameter, changing such parameter to achieve the desired weight gain was known in the art. The Appellant respectfully traverses this final rejection.

The Examiner contends that Golecki et al. disclose continuously weighing the porous structure during a CVI process. The Examiner, then admits that Golecki et al. do not weigh the entire furnace during their process. Rather, Golecki et al. weigh the internal support for the carbon substrates located in the furnace. The Examiner further reasons that Golecki et al. disclosed there were problems with this embodiment.

The Examiner then asserts that it is known in the weighing arts that electronic load sensors lose accuracy when exposed to fluctuating temperatures as shown by Yano and Spoor. The Examiner further reasons since heat rises and the Golecki et al. weighing chamber is attached to the top of the CVI/CVD furnace, there is a problem with the design of the weighing device of Golecki et al. that would be apparent to the ordinary practitioner in the weighing arts—namely, the loss of accuracy caused by vapor deposit buildup on the load cells and temperature induced variations on the accuracy of the load cells as the furnace begins to heat up. Yoshida et al., according to the Examiner, show that one solution to such a problem is to relocate the load cell outside of the hot chamber in order to thermally isolate the load cell (col. 3, lines 54-59). The Examiner then concludes that presumably the same effect would be achieved by placing the

load cells under the supporting legs at the furnace itself without any support in the cited references.

The Examiner then asserts that it is well known in the weighing art that an inexpensive way to retrofit a large existing device to enable it to weigh its contents is to place load cells under the supporting legs of the device as shown by the examples of Piroozmandi (col. 2, line 30- col. 3, line 54) and Swartzendruber (col. 2, lines 50-58). Based upon this, the Examiner concludes that it would have been obvious to the ordinary practitioner in the weighing arts to modify the CVI furnace of Golecki et al. to place the load cells in the supporting legs of a CVI furnace because this would have been an inexpensive art recognized way to retrofit an existing large device, such as a CVI furnace, to weigh and that it would also include the advantage of placing the load cells in this location would inherently isolate the load cells from the damaging environment and temperature changes inside the furnace itself thereby increasing load cell life and accuracy.

A. The References are Improperly Combined

The Examiner's combination of references is erroneous. One of ordinary skill in the art would not combine the references as suggested by the Examiner. The Examiner has used the applicant's invention as an instruction book and pure blatant hindsight to feign to reconstruct the claimed invention and call it obvious in view of the references. However, nowhere does the Examiner show in this combination that the furnace temperature is monitored and changed in order to achieve the desired weight gain as required by claim 15. Nowhere does the Examiner show that the combination of references teach the monitoring of the reactant gas flow, changing of the gas flow in order to achieve the desired weight gain of a part as required by claim 16. Furthermore, the Examiner does not even address monitoring the internal pressure of the furnace and changing such pressure to achieve the desired weight gain as required by claim 17. Finally,

the rejection is silent as the monitoring the reactivity of the reactant gas and changing the gas flow to achieve the desired weight gain of a part as required by claim 18.

Rather, the Examiner mashes together various unrelated references. The Examiner relies upon Golecki et al. (U.S. Patent No. 5,348,774) for a method of rapidly densifying a porous structure. Golecki et al. disclose the use of an in-situ weighing device (e.g. an electronic balance) to continuously monitor the weight of the substrates and susceptor during the densification run, if desired. (Golecki et al., col. 7, lines 41-46). An electrical signal proportional to the weight is put out by the electronic balance to the power supply and/or pressure controller and/or mass flow controller so that the process conditions can be optimized and adjusted. (Golecki et al., col. 7, lines 45-53). A chamber houses the balance and is thermostatically slightly above room temperature to ensure stable operation of the balance (Golecki, et al., col. 7, lines 4-10). However, as he must, even the Examiner himself even admits, Golecki et al. do not weigh the entire furnace.

The Federal Circuit has stated:

Obviousness cannot be established by combining the teachings of the prior art to produce the claimed invention, absent some teaching or suggestion supporting the combination. Under section 103, teachings of references can be combined only if there is some suggestion or incentive to do so... The mere fact that the prior art may be modified in the manner suggested by the Examiner does not make the modification obvious unless the prior art suggested the desirability of the modification. *In re Fritch*, 23 U.S.P.Q.2d 1780, 1783-84 (Fed. Cir. 1992).

One of ordinary skill in the art would not combine the teachings of Golecki et al. dealing with a method of rapidly densifying a porous structure which are weighed with the teachings of the secondary references as suggested by the Examiner. There is absolutely no reason to combine Golecki et al. with any secondary reference as Golecki et al. describe the optional use of weighing devices.

Furthermore, there is no reason to combine the primary reference with the secondary references as they are in different fields of endeavors. The primary reference deals with weight gain of a substrate in a CVI process due to a chemical reaction. The secondary references do not deal with a method of weight gain of a substrate in a CVI process or the weighing of an entire furnace. Yoshida et al. deal with the moisture content measuring system for coal. Yano et al. disclose an electronic balance for producing a digital output signal as a measured value in response to a force induced upon a tray. Spoor describes a strain-gage transducer incorporating a plurality of electrical resistance strain gages coupled together in a bridge network in order to remain zero-balanced under varying temperature conditions by way of dual resistance foil type unit interposed at one of the output corners of the bridge with its two like foil resistance elements occupying adjacent arms. Piroozmandi discloses a zero height load measuring system that can be installed under a storage vessel. The Piroozmandi system is a load measuring system for measuring the load carried by a support leg. Finally, Swartzendruber teaches an apparatus for precisely measuring the weight of a large amount of feed stored in bulk feed storage bins. The Swartzendruber apparatus include a number of electrical load cells supported upon a foundation. The weight of the bulk feed bins and any feed contained therein is supported upon the load cells by bin support legs. In response to weight induced deformation of the load cell element, electrical signals are transmitted to electrical processing circuitry. This circuitry then device can then provide a display of weight remaining in the bin. From these brief descriptions, it is evident that not one of the secondary references relates to weighing a CVI furnace or use of a weighing device with such a furnace.

Clearly the concepts of the primary reference related to rapidly densifying porous substrates by CVI are vastly different from the weighing concepts disclosed in the secondary

references. Not one of the secondary references deals with a method of weight gain of a substrate in a CVI process and are consequently not in the field of the applicant's endeavors. Furthermore, as explained in the applicant's specification, determining the weight change in the parts during processing of the parts in a CVI/CVD furnace is important in order to adjust the process parameters to arrive at the desired density of the parts. Not one of the secondary references cited by the Examiner deals with such a problem that the applicant is concerned with or its solution. Consequently, one of ordinary skill in the art would not look to all weighing references as alleged by the Examiner.

Furthermore, the references themselves do not present any motivation to have them combined in the manner suggested by the Examiner nor has the Examiner shown such suggestion. Rather the Examiner is using the applicant's specification as a road map to arrive at his improper conclusions.

B. Even if Combined, The References Do Not Render Appellant's Claims Obvious

Even if the references were combined in the manner suggested by the Examiner, they still would not render obvious the Appellant's invention. As shown above, the combination of references does not teach the method of determining the change in weight in parts of a furnace during a CVI/CVD process in which the weight change of the entire furnace is measured and a particular process parameter (furnace temperature, internal furnace pressure, reactivity of the reactant gas, reactant gas flow) is monitored and changed as needed to achieve the desired weight gain of the part.

C. The Examiner allegedly relies upon "knowledge available to one of ordinary skill in the art"

Throughout the Office Action, the Examiner asserts in piecing together a myriad of unrelated references what would actually be "knowledge available to one of ordinary skill in the

art." Applicant submits that the Examiner is not one of ordinary skill in the art. Because the Examiner is not one of ordinary skill in the art and as the references themselves do not support such a conclusion, the Examiner should not be allowed to rely upon such "alleged" knowledge.

CONCLUSION

Claims 15-18 are patentably distinguished over the multitude of cited prior art references improperly relied upon by the Examiner. The obviousness rejection of Golecki et al. in view of Yoshida et al., Yano et al., Spoor, Piroozmandi and Swartzendruber is improper because there is no motivation to combine the references as suggested by the Examiner. However, even if combined, the references do not teach Appellant's claimed invention.

In view of the foregoing discussion, it is respectfully submitted that the §103 rejection is in error and that the final rejection should be withdrawn.

APPENDIX

Claims on Appeal:

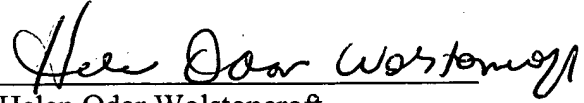
Claim 15 A method to determine the change and weight of parts in a furnace during a CVI/CVD process comprising the steps of measuring the change in weight of the entire furnace, including contents, during the CVI/CVD process, monitoring the rate of weight change, monitoring the furnace temperature, and changing the furnace temperature to achieve the desired weight gain.

Claim 16 A method to achieve a desired weight gain by determining the change and weight of parts in a furnace during a CVI/CVD process comprising the steps of measuring the change in weight of the entire furnace, including contents, during the CVI/CVD process, monitoring the rate of weight change, monitoring the reactant gas flow into said furnace and changing the reactant gas flow to achieve the desired weight gain.

Claim 17 A method to achieve a desired weight gain by determining the change and weight of parts in a furnace during a CVI/CVD process comprising the steps of measuring the change in weight of the entire furnace, including contents, during the CVI/CVD process, monitoring the rate of weight change, monitoring the internal furnace pressure and changing the internal furnace pressure to achieve the desired weight gain.

Claim 18 A method to achieve a desired weight gain by determining the change and weight of parts in a furnace during a CVI/CVD process comprising the steps of measuring the change in weight of the entire furnace, including contents, during the CVI/CVD process, monitoring the rate of weight change, monitoring the reactivity of the reactant gas and changing the reactant gas flow to achieve the desired weight gain.

Respectfully submitted,

A handwritten signature in cursive script, reading "Helen Odar Wolstoncroft", written over a horizontal line.

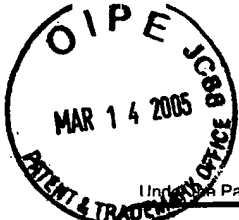
Helen Odar Wolstoncroft

Registration No. 32,806

Attorney for Applicant

March 10, 2005

BARLEY SNYDER LLC
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PTO/SB/17 (12-04)

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FEE TRANSMITTAL

For FY 2005

☐ Applicant claims small entity status. See 37 CFR 1.27

TOTAL AMOUNT OF PAYMENT (\$) 500.00

Complete if Known

Application Number	10/776,395
Filing Date	2/11/2004
First Named Inventor	James W. Rudolph
Examiner Name	R. Gibson
Art Unit	2859
Attorney Docket No.	40534-930

METHOD OF PAYMENT (check all that apply)☒ Check ☐ Credit Card ☐ Money Order ☐ None ☐ Other (please identify): _____☒ Deposit Account Deposit Account Number: 501581 Deposit Account Name: Barley Snyder LLC

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FEE CALCULATION**1. BASIC FILING, SEARCH, AND EXAMINATION FEES**

Application Type	FILING FEES		SEARCH FEES		EXAMINATION FEES		Fees Paid (\$)
	Fee (\$)	Small Entity Fee (\$)	Fee (\$)	Small Entity Fee (\$)	Fee (\$)	Small Entity Fee (\$)	
Utility	300	150	500	250	200	100	
Design	200	100	100	50	130	65	
Plant	200	100	300	150	160	80	
Reissue	300	150	500	250	600	300	
Provisional	200	100	0	0	0	0	

2. EXCESS CLAIM FEES

Fee Description	Fee (\$)	Small Entity Fee (\$)
Each claim over 20 or, for Reissues, each claim over 20 and more than in the original patent	50	25
Each independent claim over 3 or, for Reissues, each independent claim more than in the original patent	200	100
Multiple dependent claims	360	180

Total Claims	Extra Claims	Fee (\$)	Fee Paid (\$)	Multiple Dependent Claims	Fee (\$)	Fee Paid (\$)
- 20 or HP = _____ x _____ = _____						
HP = highest number of total claims paid for, if greater than 20						
Indep. Claims	Extra Claims	Fee (\$)	Fee Paid (\$)			
- 3 or HP = _____ x _____ = _____						
HP = highest number of independent claims paid for, if greater than 3						

3. APPLICATION SIZE FEE

If the specification and drawings exceed 100 sheets of paper, the application size fee due is \$250 (\$125 for small entity) for each additional 50 sheets or fraction thereof. See 35 U.S.C. 41(a)(1)(G) and 37 CFR 1.16(s).

Total Sheets	Extra Sheets	Number of each additional 50 or fraction thereof	Fee (\$)	Fee Paid (\$)
- 100 = _____ / 50 = _____ (round up to a whole number) x _____ = _____				

4. OTHER FEE(S)

Non-English Specification, \$130 fee (no small entity discount)

Other: Fee for Appeal Brief

Fees Paid (\$)

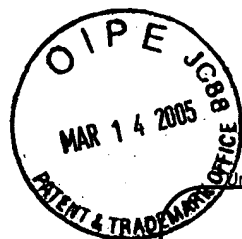
\$ 500.00

SUBMITTED BY

Signature	<i>Helen Odar Wolstoncroft</i>	Registration No. (Attorney/Agent)	32,806	Telephone	717-399-1579
Name (Print/Type)	Helen Odar Wolstoncroft	Date	3/10/2005		

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Application Number

10/776,395

Filing Date

2/11/2004

First Named Inventor

James W. Rudolph

Art Unit

2859

Examiner Name

R. Gibson

Attorney Docket Number

40534-930

ENCLOSURES (Check all that apply)

<input checked="" type="checkbox"/> Fee Transmittal Form	<input type="checkbox"/> Drawing(s)	<input type="checkbox"/> After Allowance Communication to TC
<input checked="" type="checkbox"/> Fee Attached (\$500)	<input type="checkbox"/> Licensing-related Papers	<input type="checkbox"/> Appeal Communication to Board of Appeals and Interferences
<input type="checkbox"/> Amendment/Reply	<input type="checkbox"/> Petition	<input checked="" type="checkbox"/> Appeal Communication to TC (Appeal Notice, Brief, Reply Brief) (3 copies)
<input type="checkbox"/> After Final	<input type="checkbox"/> Petition to Convert to a Provisional Application	<input type="checkbox"/> Proprietary Information
<input type="checkbox"/> Affidavits/declaration(s)	<input type="checkbox"/> Power of Attorney, Revocation	<input type="checkbox"/> Status Letter
<input type="checkbox"/> Extension of Time Request	<input type="checkbox"/> Change of Correspondence Address	<input checked="" type="checkbox"/> Other Enclosure(s) (please identify below):
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<input type="checkbox"/> Reply to Missing Parts under 37 CFR 1.52 or 1.53		
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SIGNATURE OF APPLICANT, ATTORNEY, OR AGENT

Firm Name	Barley Snyder LLC (Customer No. 44023)		
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Printed name	Helen Odar Wolstoncroft		
Date	3/10/2005	Reg. No.	32,806

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